



DEPARTMENT OF THE NAVY  
NAVAL AIR SYSTEMS COMMAND  
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IN REPLY REFER TO

NAVAIRINST 3502.1  
AIR-5.5

16 MAR 2001

NAVAIR INSTRUCTION 3502.1

From: Commander, Naval Air Systems Command

Subj: F/A-18B/D FLEET DEPARTURE TRAINING STANDARDIZATION PROGRAM

Ref: (a) NSATS Departure Demonstration Test Plan #2206  
(b) F/A-18A/B/C/D NATOPS A1-F18AC-NFM-000  
(c) F/A-18A/B/C/D High Angle of Attack Flying Qualities and Departure Characteristics Brief dtd 01 Jan 01  
(d) F/A-18A/B/C/D Flight Control Surface Rigging and Radome Brief dtd 01 Jan 01  
(e) NAWCAD Training Video #806021

Encl: (1) COMNAVAIRSYSCOM Flight Clearance  
(2) F/A-18A/B/C/D Departure Training Program Simulator Briefing Guide  
(3) F/A-18A/B/C/D Departure Training Program Flight Briefing Guide  
(4) Departure Training Instructor Pilot Qualification Format  
(5) Sample FRS Departure Training Instructor Pilot Endorsement Letter  
(6) Sample NAVAIR Departure Training Standardization Pilot Designation Letter

1. Purpose. To define the F/A-18B/D Fleet Departure Training Program and establish policy, responsibilities, and procedures for program execution. The Departure Training Program will introduce advanced handling characteristics of the F/A-18 aircraft to fleet aircrew and Fleet Replacement Squadron (FRS) students through the process of technical briefings, simulation, and controlled exposure to actual high angle of attack (AOA) and departed flight conditions.

2. Scope. This instruction defines the Fleet Departure Training Program, details standardization and currency requirements for Naval Air Systems Command (NAVAIR) Departure Training Standardization Pilots and FRS Departure Training Instructor Pilots, and outlines the training syllabus.

3. Background. As of 01 Jan 2001, the F/A-18 community has lost a total of fourteen airplanes due to out-of-control flight. As a result, there has been a growing concern that fleet F/A-18 pilots do not have a thorough understanding of F/A-18 high angle of attack and departure characteristics nor experience in departure mode recognition and recovery. The Naval Air Warfare Center Aircraft Division (NAVAIRWARCENACDIV) has been conducting departure flight-testing and demonstrations (reference (a)) for United States Navy (USN) and Foreign Military Sales (FMS) customers since 1994. The departure demonstration flights are designed to improve the F/A-18 pilot's awareness and understanding of impending departure cues, departure characteristics, and recovery procedures. The United States Naval Test Pilot School (USNTPS) has been requested by F/A-18 Strike Fighter Program (PMA-265) to develop, through cooperation with the Naval Strike Aircraft Test Squadron (NSATS), a program that will provide

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F/A-18 pilots exposure to high angle of attack flying qualities, departure modes, and recovery procedures.

#### 4. Definitions

a. NAVAIR Departure Training Standardization Pilot. A USNTPS or NSATS pilot qualified to administer standardization training to FRS Departure Training Instructor Pilots. Standardization pilots are designated in writing by the Commander, Naval Test Wing Atlantic (COMNAVTESTWINGLANT).

b. FRS Departure Training Instructor Pilot. An FRS instructor pilot, who has received formal standardization training, is recommended for designation by the COMNAVTESTWINGLANT and is designated in writing by the Commanding Officer, Fleet Replacement Squadron.

c. Departure Training Program Manager. A USNTPS flight staff instructor pilot designated by the Commanding Officer, USNTPS that provides program administration, manages the technical content of the program (ground and flight training), and documents the NAVAIR Departure Training Standardization Pilot and FRS Departure Training Instructor Pilot training records.

5. Program Organization. The Departure Training Program is a NAVAIR sponsored program that is managed by USNTPS and supported by NSATS. The authority to designate NAVAIR Departure Training Standardization Pilots and recommend designation for FRS Departure Training Instructor Pilots is delegated to the COMNAVTESTWINGLANT.

6. Flight Clearance. All flights associated with the Departure Training Program will be conducted within the current limits of the F/A-18A/B/C/D Naval Air Training and Operating Procedures Standardization (NATOPS), (reference (b)) as modified by NAVAIR flight clearance (enclosure (1)) specifically issued for the Departure Training Program. The flight clearance will be issued by NAVAIR Airworthiness (AIR-4.0P).

7. Policy. Fleet departure training flights authorized by this instruction may only be flown with a qualified NAVAIR Departure Training Standardization Pilot or FRS Departure Training Instructor Pilot acting as pilot in command of the aircraft.

8. Fleet Departure Training Program Syllabus Outline. The Fleet Departure Training Program consists of three separate training phases. First, the students will receive ground training in the form of several technical briefings on F/A-18A/B/C/D high angle of attack flying qualities and departure flight characteristics (references (c), (d), and (e)). Second, a simulator session will expose the student to the specific training maneuvers and cockpit procedures required for the flight-training phase (enclosure (2)). Departure recognition cues and recovery procedures will also be discussed and reviewed. The final phase of the training will be a high AOA/departure training syllabus flight (enclosure (3)).

9. FRS Departure Training Instructor Pilot Qualification Process. The following synopsis briefly describes the process to designate FRS Departure Training Instructor Pilots.

a. During the NAVAIR standardization visit, the FRS Instructor Pilots under instruction will receive a period (approximately 3-4 hours) of ground training (references (c), (d), and (e)), a simulator session (enclosure (2)), and three standardization flights (enclosure (3)). The first two flights may be scheduled as "back-to-back" flights with a hot refueling in between where the FRS Instructor Pilot under instruction will occupy the front seat. The third flight will serve as the final standardization check flight, where the FRS Instructor pilot will brief the flight, fly from the aft seat, and debrief the entire evolution, demonstrating a thorough knowledge of program objectives.

b. In addition to the pilot training, there will be a portion of the ground training that will include select maintenance representatives. This training will focus on specific aircraft rigging procedures and maintenance related issues associated with the radome (reference (d)).

c. Once the ground and flight training requirements have been successfully completed, the USNTPS Departure Training Program Manager (PM) will submit the FRS Departure Training Instructor Pilot Qualification Form (enclosure (4)) to the Commanding Officer, USNTPS and subsequently to the COMNAVTESTWINGLANT for recommendation. COMNAVTESTWINGLANT will forward to the FRS Commanding Officer an endorsement letter (enclosure (5)) recommending designation as FRS Departure Training Instructor Pilot. Each FRS Departure Training Instructor Pilot will be designated by their respective Commanding Officer, Fleet Replacement Squadron.

10. NAVAIR Departure Training Standardization Pilot Qualification Syllabus. The qualification syllabus for the NAVAIR Departure Training Standardization Pilots follows the same three-phased approach as the FRS Departure Training Instructor Pilot syllabus including ground training, simulation, and flight training with the addition of a Manual Spin Recovery Mode (MSRM) demonstration maneuver. This maneuver, detailed in (enclosure (3)), exposes the candidate standardization pilot to the spin mode engagement parameters, adverse yaw effects, and provides a demonstration of airplane handling qualities while in MSRM. Throughout the syllabus, emphasis is placed on instructional techniques for departure avoidance, departure recognition, and recovery procedures.

11. Currency. The following recommended minimums apply:

a. FRS Departure Training Instructor Pilots

(1) If 45 days or less has transpired since the last departure flight, the instructor is current and may fly instructional flights.

(2) If more than 45 days has lapsed since the last departure flight, the instructor requires a departure training simulator session with a current instructor pilot as outlined in (enclosure (3)) prior to instructional flights being flown.

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(3) If more than 90 days has lapsed since the last departure flight, the instructor requires a departure training simulator session and one F/A-18 departure flight with a current FRS Departure Training Instructor Pilot or NAVAIR Departure Training Standardization Pilot prior to instructional departure flights being flown.

b. NAVAIR Departure Training Standardization Pilots

(1) If 30 days or less has transpired since the last departure flight, the instructor is current and may fly instructional flights.

(2) If more than 30 days has lapsed since the last departure flight, the instructor requires a departure training simulator session with a current instructor pilot as outlined in (enclosure (3)) prior to instructional flights being flown.

(3) If more than 90 days has lapsed since the last departure flight, the instructor requires a departure training simulator session and one F/A-18 departure flight with a current instructor pilot prior to instructional departure flights being flown. If all instructor pilots are not current, the instructor pilot requires a departure training simulator session, a spin demonstration flight in a T-2C aircraft, and one F/A-18 departure flight prior to instructional departure flights being flown.

12. Responsibilities

a. NAVAIR. The F/A-18 Strike Fighter Program Office (PMA-265) will provide overall program oversight and funding for the NAVAIR Departure Training Standardization Pilots initial qualification and currency. NAVAIR will also provide engineering support as required.

b. NAVTESTWINGLANT. The COMNAVTESTWINGLANT will designate NAVAIR Departure Training Standardization Pilots from either USNTPS or NSATS via (enclosure (5)). Upon successful completion of departure training, the COMNAVTESTWINGLANT will forward to the FRS Commanding Officer an endorsement (enclosure (4)) recommending designation as FRS Departure Training Instructor Pilot. NAVTESTWINGLANT, USNTPS and NSATS will provide manpower ( three flight, one academic instructor) to train up to six FRS instructor pilots at each F/A-18 FRS, totaling 12 man-weeks worth of effort per 18 month period.

c. USNTPS. The Commanding Officer, USNTPS will designate the Departure Training PM. Specific responsibilities include:

(1) Provide NAVAIR Departure Training Standardization Pilots.

(2) Coordinate all initial standardization training and periodic unit evaluations with each F/A-18 FRS.

(3) Provide academic briefings that cover F/A-18 high angle of attack flying qualities, departure recognition and recovery procedures, and aircraft rigging and radome maintenance issues (references (c), (d), and (e)) to FRS Training Officers.

(4) Administer the flight-training portion of the FRS Departure Training Instructor Pilot qualification syllabus to include a simulator session and three standardization flights. The third flight will serve as the final standardization check flight. The specific details of the simulator session and flights are presented in (enclosures (2) and (3)).

(5) Conduct periodic FRS Departure Training Program unit evaluations every 18 months. During this period, the overall FRS Departure Training Program will be reviewed and new FRS Departure Training Instructor Pilots will be qualified as required.

(6) Document and record the training qualifications, endorsements, and designations of NAVAIR Departure Training Standardization Pilots and FRS Departure Training Instructor Pilots.

(7) Maintain control of curriculum content of all academic briefs, simulation and flight briefing guides, and training videos.

d. NSATS. The Commanding Officer, NSATS will assist USNTPS with program administration and will maintain standardization pilots to augment USNTPS during FRS standardization site visits.

e. Type Wing Commanders (TYWINGCOM). NAVAIR requires TYWINGCOM provide funding for Standardization Instructor site visit Temporary Additional Duty (TAD) travel expenses.

f. FRS

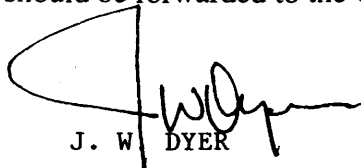
(1) Select an appropriate number of candidate FRS Departure Training Instructor Pilots. The number should be as few as deemed necessary (up to six) to fulfill curriculum requirements. Consideration should be given to the amount of time the FRS Instructor Pilot has remaining in the squadron.

(2) Coordinate with USNTPS for the scheduling of academic training, simulators, and training flights.

(3) Provide aircraft for the departure training flights that have been inspected for proper flight control surface rigging and radome anomalies prior to departure training flights.

(4) Will maintain approved departure-training material and forward any recommendations for change or update to the content of training materials to the USNTPS Departure Training PM for review and approval.

13. Review. The USNTPS Departure Training Program Manager will review this instruction annually on its anniversary and will submit change recommendations to NAVAIR. Change recommendations to this instruction should be forwarded to the USNTPS Departure Training Program Manager (301) 342-4131.



J. W. DYER

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## COMNAVAIRSYSCOM Flight Clearance 16 Mar 01

PTTUZYUW RULSABU1234 0662007-UUUU--RHMCSUU.  
ZNR UUUUU  
P 072007Z MAR 01 ZYB

FM COMNAVAIRSYSCOM PATUXENT RIVER MD//4.0P//

TO COMNAVAIRLANT NORFOLK VA//N421//  
COMNAVAIRPAC SAN DIEGO CA//N421B//

INFO PEOTACAIR PATUXENT RIVER MD//PMA265//  
CG THIRD MAW//G3//  
MAG ELEVEN//S3//  
VMFAT ONE ZERO ONE//S3T//  
STRKFITRON ONE ZERO SIX  
STRKFITRON ONE TWO FIVE  
NAVTESTWINGLANT PATUXENT RIVER MD//55TW3AA//  
NAVTESTPILOTSCH PATUXENT RIVER MD//JJJ//  
NAVSTKAIRSTRON PATUXENT RIVER MD//553100AFA18/  
4KSA60A//  
COMNAVAIRSYSCOM PATUXENT RIVER MD//5.0D//  
COMNAVAIRWARCENACDIV PATUXENT RIVER MD//4.11.1.1//  
BT  
UNCLAS //N13034//

MSGID/GENADMIN/NASC/4.0P//

SUBJ/INTERIM FLIGHT CLEARANCE FOR FA-18 B/D FLEET DEPARTURE TRAINING  
/FLIGHTS IAW THE FLEET REPLACEMENT SQUADRON SYLLABUS//

REF/A/MSG/PEOTACAIR/041314ZJAN01//  
REF/B/MSG/COMNAVAIRSYSCOM/292006ZJUN2000//  
REF/C/DOC/COMNAVAIRSYSCOM/24OCT00//

AMPN/REF A IS FLIGHT CLEARANCE REQUEST. REF B IS EXISTING INTERIM  
FLIGHT CLEARANCE FOR FA-18 B/D DEPARTURE DEMONSTRATION FLIGHTS. REF C IS  
NAVAIRINST 13034.1B, FLIGHT CLEARANCE POLICY FOR MANNED AIR VEHICLES//

RMKS/1. IRT REF A, FLIGHT CLEARANCE IS GRANTED TO CONDUCT FA-18B/D FLEET  
DEPARTURE TRAINING FLIGHTS IN SUPPORT OF THE FLEET REPLACEMENT SQUADRON  
DEPARTURE TRAINING PROGRAM. FLIGHT CLEARANCE IS GRANTED TO UTILIZE US  
NAVAL TEST PILOT SCHOOL, NAVAL STRIKE AIRCRAFT TEST SQUADRON, OR FLEET  
REPLACEMENT SQUADRON AIRCRAFT TO CONDUCT THE DEPARTURE TRAINING FLIGHTS.  
AIRCRAFT SUBJECT TO THE CONFIGURATION AND LIMITS BELOW:

2. CONFIGURATION/LOADING: IAW F/A-18A-D NATOPS/TACMAN WITH THE FOLLOWING  
EXCEPTIONS/ADDITIONS:

A. STATION

- 1,9 EMPTY LAU-7
- 2,8 EMPTY
- 3,7 EMPTY OR SYMMETRICALLY INSTALLED PYLONS
- 4,6 MISSILE WELL COVERS OR EMPTY LAU-116A/A
- 5 PYLON, 330-GAL TANK, EMPTY OR C BAND BEACON

B. OFP LOADS IAW NATOPS OR OTHER VALID FLIGHT CLEARANCE.

C. F/A-18D WITH TRAINER CONVERSION KIT INSTALLED.

Enclosure (1)

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3. LIMITS: IAW FA-18A-D NATOPS/TACMAN WITH THE FOLLOWING ADDITIONS AND EXCEPTIONS:

A. THE FOLLOWING NATOPS PROHIBITED MANEUVERS ARE AUTHORIZED FOR THIS FLIGHT CLEARANCE ONLY:

1. INTENTIONAL DEPARTURES AND ZERO AIRSPEED TAIL SLIDES.
  2. ZERO G FOR UP TO 15 SECONDS DURING TAIL SLIDES AND 100-KNOT VERTICAL RECOVERIES.
  3. INTENTIONAL YAW RATES IN EXCESS OF 25 DEG/SEC WITH FCS IN CAS OR ASRM.
  4. FOR NAWCAD STANDARDIZATION PILOTS ONLY: INTENTIONAL SELECTION OF THE SPIN RECOVERY SWITCH TO THE RCVY POSITION IN CONTROLLED FLIGHT (BELOW 250 KCAS). SPIN RECOVERY SELECTION SWITCH SHALL BE RETURNED TO NORM POSITION AT ONSET OF AOA OR YAW TONE.
- B. ALL HIGH AOA/HIGH YAW RATE MANEUVERING TO BE CONDUCTED WITHOUT CENTERLINE TANK OR WITH CENTERLINE TANK EMPTY.
- C. MINIMUM ALTITUDE FOR ENTRY INTO HIGH AOA/HIGH YAW RATE MANEUVERS IS 30,000 FT AGL.
- D. MAXIMUM SPEED FOR ENTRY INTO PARA 3.A. MANEUVERS IS 0.7 IMN.
- E. ALL HIGH AOA/HIGH YAW RATE MANEUVERING SHALL BE
- F. CONDUCTED WITH CG AT OR FORWARD OF 23.0 PERCENT MAC.
- F. OUT OF CONTROL FLIGHT RECOVERY PROCEDURES IAW NATOPS.

4. SPECIAL NOTES, CAUTIONS AND WARNINGS:

A. FLIGHT TEST RESULTS HAVE SHOWN THE POSSIBILITY OF AN ANGLE OF ATTACK PROBE MISMATCH DURING OUT OF CONTROL FLIGHT THAT COULD LEAD TO IMPROPER LEADING EDGE FLAP POSITIONS. THOUGH THE RISK OF THIS EVENT OCCURRING IS SMALL, THIS CONDITION MAY AGGRAVATE AND PROLONG A DEPARTURE OR LEAD TO A REDEPARTURE.

5. TIME PERIOD: THIS FLIGHT CLEARANCE EXPIRES 31 JAN 04.

6. POINTS OF CONTACT:

PMA-265 CLASS DESK, CDR C. EVERETT (301) 757-7575  
AIR-5.5.4 DEPARTURE TRAINING PROGRAM MGR, LCDR K. GREENE (301) 757-5043  
AIR-5.5.4 AST DEPARTURE TRAINING PROGRAM MGR, S. POTTER (301) 757-5020  
AIR-5.5.3 NSATS PROJECT OFFICER, MAJ S. WHITLEY (301) 757-0673  
AIR-4.11.1.1 NSATS LEAD PROJECT ENGINEER, E. BECK (301) 757-4475  
AIR-4.3.2.4 F-18A-D FLYING QUALITIES, J. WILT (301) 342-8565  
AIR-4.0P FLIGHT CLEARANCE, CDR S. WHITE (301) 342-0135

7. OTHER REMARKS:

A. CLEARANCE FOR C-BAND BEACON SHALL BE PROVIDED VIA SEPCOR AND IAW FCRA EMPOWERED FLIGHT CLEARANCE AUTHORITY.

B. THIS INTERIM CLEARANCE OPENS THE DEPARTURE TRAINING CONFIGURATION TO ALLOW INBOARD PYLONS. AN ENVELOPE EXPANSION FLIGHT TEST PROGRAM IS CURRENTLY ONGOING AT NAWCAD PATUXENT RIVER THAT WILL INVESTIGATE CENTER OF GRAVITY LIMITATIONS. ONCE FLIGHT TEST DATA HAS BEEN THOROUGHLY REVIEWED A FINAL FLEET DEPARTURE TRAINING FLIGHT CLEARANCE WILL BE RELEASED.

C. REF C PROVIDED FOR GUIDANCE ON STANDARD POLICY AND ASSISTANCE IN PREPARATION OF FUTURE REQUESTS FOR FLIGHT CLEARANCE. //

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## F/A-18B/D DEPARTURE TRAINING PROGRAM SIMULATOR BRIEFING GUIDE

Simulator Time: 1.0

Brief Time: 1.0

Debrief Time: 1.0

Simulator: F/A-18 operational flight trainer, weapons tactics trainer, or piloted engineering simulator

Prerequisites: Personal study and complete review of the following documents and videotape prior to the simulator session:

- a. F/A-18A/B/C/D NATOPS (A1-F18AC-NFM-000) - PART I, section 2.8 and PART IV
- b. COMNAVAIRSYSCOM Flight Clearance for the Departure Training Program (DTG 072007ZMAR01)
- c. NAVAIRINST 3502.1, F/A-18B/D Fleet Departure Training Standardization Program
- d. NAWCAD Training Video #806021: The Edge of the Envelope: Understanding the F/A-18 Out of Control

Successful completion of ground training provided by a qualified NAVAIR Departure Training Standardization Pilot or FRS Departure Training Instructor Pilot:

- a. F/A-18A/B/C/D High Angle of Attack Flying Qualities and Departure Characteristics Briefing
- b. F/A-18A/B/C/D High AOA - Departure Training Aircraft Preparation and Checks Briefing

Mission: To expose students to the specific training maneuvers and cockpit procedures required for the flight-training phase. To discuss and review departure recognition cues and recovery procedures. To practice the departure maneuvers to be instructed in the F/A-18 aircraft and expose the student to lessons learned from previous departure training evolutions.

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### STUDENT BRIEF

1. Aircraft G Limitations: Symmetrical and asymmetrical "G" limits will be discussed from memory for 32,500 and 36,000 lb gross weights. (NATOPS)
2. Aircraft AOA Limitations. Discuss from memory AOA limitations for fighter escort configuration with centerline tank and CG from 17-23.5 % MAC. Also discuss F/A-18 B/D AOA limits due to Mach number. (NATOPS)
3. Key Airspeeds, AOAs. State key airspeeds, AOAs and significance of each. (TOPGUN Chapter 33)
4. Out of Control Flight (OCF). Discuss of the factors that directly affect entry and recovery of aircraft when out of control flight conditions exist. (NATOPS)
5. OCF Modes. Discuss the different OCF modes and their indications. (NATOPS)
6. OCF/Spin Procedures. State the immediate actions steps verbatim from memory. (NATOPS)
7. NATOPS Restrictions. State from memory applicable NATOPS prohibited maneuvers. (NATOPS)
8. Engine Relight Procedures State from memory NATOPS procedure for engine relight. (NATOPS)
9. Engine Parameters: State from memory Hung/Stall/Overtemp engine indications. (NATOPS)

### IP BRIEF

1. F/A-18 Departure Flight Clearance. Discuss in detail the flight clearance that authorizes the performance of the NATOPS prohibited maneuvers to be conducted only on this specific flight.
2. F/A-18 Rig Checks. Discuss the PMCF "C" profile flight control surfaces rig checks, and accelerated flight radome checks. Reference date and type of last PMCF flown on assigned aircraft.
3. F/A-18B/D Departure Susceptibility Regions. Brief departure tendencies and techniques for reducing aircraft susceptibility.
4. Low AOA Departure Maneuver Brief. The conduct of the Low AOA departure maneuver to be demonstrated during this flight.

5. Engine Anomalies. Brief potential engine anomalies that may be experienced during departure demonstration to include the dual fuel starvation relight profile.

### SIMULATOR CONDUCT

1. Vertical Recovery. 15,000 ft AGL/400 kts in MAX power. Perform the maneuver by pulling 4 G's to the vertical, maintain pure vertical until 200 kts then smoothly pull to the horizon not exceeding 35° AOA. Note altitude gain. This is a "tactical" vertical recovery. Emphasize the "tactical" pitch authority available with  $\geq 200$  kts. Below 200 kts a longitudinal pull may not be the optimum transition from the vertical.

2. High AOA Static Stability Demonstration and Radome Check. 35,000 ft AGL/250 kts. Wings level, trim lateral and directional to ensure a centered ball. Reduce throttles symmetrically to IDLE. Monitor DDI FCS display. Sample lateral stick and rudder pedals inputs for bank- to- bank rolls at 15° and 25° AOA. Smoothly increase longitudinal stick full aft and hold for 5 seconds; observe flight characteristics. Recover - neutralize longitudinal stick and advance throttles.

3. Accelerated Flight Radome Checks. 35,000ft AGL/200 kts. Reduce throttles to idle, roll into a left/right 90° AOB turn, then slowly apply full aft stick (~2 second input). Hold aft stick for five seconds and observe roll, yaw and pitch rates. Repeat in opposite direction above 30,000 ft AGL.

4. Automatic SRM Demonstration. 35,000 ft AGL/150 kts. Slowly reduce both throttles to IDLE. Set pitch attitude to approximately 20-25 deg. At AOA tone onset, increase one engine smoothly to MIL, while continuing to maintain attitude until full aft stick is reached (maintain stick against aft stop throughout the maneuver with no more than 1 inch of opposite lateral stick to the intended spin direction). Identify/observe spin motion. Check DDI - Spin Mode, (Note: Spin arrow appearance and direction). Slowly apply full lateral stick with Spin Arrow ( $\geq 26,000$  ft AGL). Check DDI - Spin Mode Engaged. Observe yaw rate - Stop. Check both throttles - IDLE. Complete NATOPS recovery.

5. Low AOA/Rudder Departure Demo. IP will demonstrate this maneuver during the flight phase. 35,000 ft AGL/< 210 kts with centerline in MIL power (adjust throttle friction for stiff throttles). Pull aircraft up to 25° pitch attitude. Pushover to 0° ( $\pm 5^\circ$ ) AOA, then abruptly apply full rudder pedal and hold. Maintain 0° to 3° AOA with longitudinal stick. Retard throttles to IDLE upon first sign of departure (vortex rumble, side forces, etc.). Upon departure, recover per NATOPS OCF procedures.

6. Vertical Departures. 30,000 ft AGL/300 kts in MIL Power. Calculate CG prior to each maneuver.

a. (Tailslide) MIL Power. Smoothly pull the nose up to attain 70°-90° pitch attitude with the waterline symbol (1% rule). Use longitudinal stick to maintain nose position. Retard throttles to IDLE at departure. Recover per NATOPS procedures.

b. (100 kt Vertical Recovery) MIL Power. Perform the maneuver by pulling 2-3 G's to the vertical. Maintain pure vertical until 100 kts then pull to the horizon. Attempt to keep the aircraft's nose tracking through the horizon. When tracking of aircraft's nose is no longer possible, reduce throttles to idle. Recover per NATOPS OCF procedures. Repeat maneuver as required.

\*\*\*\*\* MSRM DEMO FOR STANDARDIZATION PILOTS ONLY\*\*\*\*\*

7. Manual Spin Recovery Mode (MSRM) Demonstration. At 35,000 ft AGL, 200 KCAS, wings level, 1 g flight check that the fuel transfer is normal. The flight clearance authorizes selection of the spin recovery switch below 250 KCAS. Set the Spin Recovery Switch – RCVY. Ensure flight controls remain in CAS. If not, return the switch to NORM and terminate check. Verify both DDI's - SPIN MODE. Raise the nose to 25° nose up pitch attitude and reduce power to IDLE. Unload with slight forward stick to keep AOA between 10 and 20° until the SRM engages, at 120 KCAS. Smoothly capture level flight and modulate thrust to maintain level unaccelerated flight at less than 230 KCAS and 20° AOA. Stabilize briefly using small lateral stick deflections and observe the deflection of the ailerons and adverse yaw. Do not exceed 230 KCAS. Perform banked aileron only, rudder only, and coordinated turns using less than 30° of bank angle. Set the Spin Recovery Switch – NORM. No significant altitude loss is expected. (Note: With increasing side force, AOA or yaw tone, set Spin Recovery Switch – NORM)

\*\*\*\*\* MSRM DEMO FOR STANDARDIZATION PILOTS ONLY\*\*\*\*\*

F/A-18 B/D DEPARTURE TRAINING PROGRAM  
FLIGHT BRIEFING GUIDE

Mission Time: 1.2 (per flight)

Brief Time: 2.0

Debrief Time: 2.0

Aircraft: F/A-18B/D, VTR (Sta 1, 2, 4, 6, 8, 9 – empty, Sta 3, 7 – pylon)

Weather: Day/15,000/3nm (For departure training need a defined horizon, ground reference, maximum cloud coverage of 6000 ft AGL Ovc and/or 15,000 ft Bkn.)

Prerequisites: Successful completion of ground training and simulator session provided by a qualified NAVAIR Departure Training Standardization Pilot or FRS Departure Training Instructor Pilot

Mission: To expose student pilots to the advanced handling characteristics of the F/A-18 through flight demonstration of impending departure cues, aircraft departure characteristics, and recovery procedures. Provide the standardization flights required to qualify the designated NAVAIR standardization pilots and FRS instructors for departure maneuver instruction.

Flight Execution: a. 1 flight for FRS students or fleet pilots authorized for Departure Training

b. 3 flight IUT syllabus – flight #1 and #2 IUT in front seat, flight # 3 IUT back seat (Check Flight).

STUDENT BRIEF

1. Aircraft G Limitations: Symmetrical and asymmetrical “G” limits will be discussed from memory for 32,500 and 36,000 lb gross weights. (NATOPS)
2. Aircraft AOA Limitations: Discuss from memory AOA limitations for Fighter Escort Configuration with centerline tank and CG from 17-23.5 % MAC. Also discuss F/A-18 B/D AOA limits due to Mach number. (NATOPS)
3. Key Airspeeds, AOAs: State key airspeeds, AOAs and significance of each. (TOPGUN Chapter 33)

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4. Out of Control Flight: Discuss NATOPS description of the factors that directly affect entry and recovery of aircraft when out of control flight conditions exist. (NATOPS)
5. OCF Modes: Discuss the different OCF modes and their indications. (NATOPS)
6. OCF/Spin Procedures: State the immediate actions steps verbatim from memory. (NATOPS)
7. NATOPS Restrictions: State from memory applicable NATOPS prohibited maneuvers. (NATOPS)
8. Engine Relight Procedures: State from memory NATOPS procedure for engine relight. (NATOPS)
9. Engine Parameters: State from memory Hung/Stall/Overtemp engine indications. (NATOPS)

#### IP BRIEF

1. F/A-18 Departure Flight Clearance. Discuss in detail the COMNAVAIRSYSCOM Flight Clearance that authorizes the performance of the NATOPS prohibited maneuvers to be conducted only on this specific departure training flight. Review all limitations imposed by the flight clearance (e.g. Aft CG limit).
2. F/A-18 Rig Checks. Discuss the PMCF "C" profile flight control surfaces rig checks, and accelerated flight radome checks. Reference date and type of last PMCF flown on assigned aircraft.
3. F/A-18B/D Departure Susceptibility Regions. Brief departure tendencies and techniques for reducing aircraft susceptibility.
4. Low AOA Departure Maneuver. Brief the conduct of the Low AOA Departure maneuver to be demonstrated during this flight.
5. Engine Anomalies. Brief potential engine anomalies that may be experienced during departure demonstration to include the dual fuel starvation relight profile.
6. Special Precautions. Brief the special precautions for the departure training flight and lessons learned from previous flights.

## FLIGHT CONDUCT

1. Airborne Rig Check. (IUT Only/As Required) 10,000 ft MSL/200 kts. Do not trim laterally after setting takeoff trim. Check memory inspect UNIT 14, ADDRESS 5016 first and third lines are all ZEROS. If first and third lines are not zero, adjust lateral trim to zero reading. In wings level, 1 "G" flight, balance ball for trimmed flight. Release stick and record direction and time to 30 deg AOB (should be > 6 sec). Repeat rig check at 300, 400 and 500 kts.
2. PMCF Spin Recovery Mode Check. (IUT Only/As Required) 30,000 ft AGL/200 kts. In 1 "G" wings level flight select SRM switch – RCVY. (Ensure flight controls remain in CAS, if not CAS, RTB.) Check DDI's – SPIN MODE. Raise aircraft nose up to 25 deg pitch attitude. Reduce throttles to IDLE. Unload AOA 10 – 20 deg to engage Spin mode ( $120 \pm 15$  kts). Check DDI's – SPIN MODE ENGAGED (Hold approximately 30 deg nose down once engaged). Accelerate nose low to disengage SRM (about 245 kts). Check DDI's – SPIN MODE. Select SRM switch – NORM.
3. High AOA Static Stability Demonstration and Radome Check. 35,000 ft AGL/250 kts. Wing level, trim lateral and directional to ensure a centered ball with zero roll rate. Reduce throttles symmetrically to IDLE. Monitor DDI FCS display. Sample lateral stick and rudder pedals inputs for bank- to- bank rolls at  $15^\circ$  and  $25^\circ$  AOA. Smoothly increase longitudinal stick full aft and hold for five seconds, observe flight characteristics. Recover - neutralize longitudinal stick and advance throttles.
4. Accelerated Flight Radome Checks. 35,000ft AGL/200 kts. Reduce throttles to idle, roll into a left/right  $90^\circ$  AOB turn, then slowly apply full aft stick (~2 second input). Hold aft stick for five seconds and observe roll, yaw and pitch rates. Repeat in opposite direction above 30,000 ft AGL. (Note: If abnormal tendencies, yaw tone, spin logic activates – Neutralize longitudinal stick and RTB.)
5. Automatic SRM Demonstration. 35,000 ft AGL/150 kts. Slowly reduce both throttles to IDLE. Set pitch attitude to approximately 20-25 deg. At AOA tone onset, increase one engine smoothly to MIL, while continuing to maintain attitude until full aft stick is reached (maintain stick against aft stop throughout the maneuver with no more than 1 inch of opposite lateral stick to the intended spin direction). Identify/observe spin motion. Check DDI - Spin Mode, (Note: Spin arrow appearance and direction). Slowly apply full lateral stick with Spin Arrow ( $\geq 26,000$  ft AGL). Check DDI – Spin Mode Engaged. Observe yaw rate - Stop. Check both throttles – IDLE. Complete NATOPS recovery.
6. Low AOA/Rudder Departure Demo. (IP will demonstrate this maneuver.) 35,000 ft AGL / < 210 kts with centerline in MIL power (adjust throttle friction for stiff throttles). Pull aircraft up to  $25^\circ$  pitch attitude. Pushover to  $0^\circ (\pm 5^\circ)$  AOA, then abruptly apply full rudder pedal and hold. Maintain  $0^\circ$  to  $3^\circ$  AOA with longitudinal stick. Retard throttles to IDLE upon first sign of departure (vortex rumble, side forces, etc.). Upon departure, recover per NATOPS OCF procedures.

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7. Vertical Departures: 30,000 ft AGL/300 kts in MIL Power. Calculate CG prior to each maneuver.

(1) (Tailslide) MIL Power. Smoothly pull the nose up to attain 70° – 90° pitch attitude with the waterline symbol (1% rule). Use longitudinal stick to maintain nose position. Retard throttles to IDLE at departure. Recover per NATOPS procedures.

(2) (100 kt Vertical Recovery) MIL Power. Perform the maneuver by pulling 2-3 G's to the vertical. Maintain pure vertical until 100 kts then smoothly pull to the horizon. Attempt to keep the aircraft's nose tracking through the horizon. When tracking of aircraft's nose is no longer possible, reduce throttles to idle. Recover per NATOPS OCF procedures. Repeat maneuver as required.

\*\*\*\*\* MSRM DEMO FOR STANDARDIZATION PILOTS ONLY\*\*\*\*\*

8. Manual Spin Recovery Mode (MSRM) Demonstration. At 35,000 ft AGL, 200 KCAS, wings level, 1 g flight check that the fuel transfer is normal. The flight clearance authorizes selection of the spin recovery switch below 250 KCAS. Set the Spin Recovery Switch - RCVY. Ensure flight controls remain in CAS. If not return the switch to NORM and terminate check. Verify both DDI's - SPIN MODE. Raise the nose to 25° nose up pitch attitude and reduce power to IDLE. Unload with slight forward stick to keep AOA between 10 and 20° until the SRM engages, at 120 KCAS. Smoothly capture level flight and modulate thrust to maintain level unaccelerated flight at less than 230 KCAS and 20° AOA. Stabilize briefly using small lateral stick deflections and observe the deflection of the ailerons and adverse yaw. Do not exceed 230 KCAS. Perform banked aileron only, rudder only, and coordinated turns using less than 30° of bank angle. Set the Spin Recovery Switch - NORM. No significant altitude loss is expected. (Note: With increasing side force, AOA or yaw tone, set Spin Recovery Switch – NORM)

\*\*\*\*\* MSRM DEMO FOR STANDARDIZATION PILOTS ONLY\*\*\*\*\*



## Departure Training Instructor Pilot Qualification Format

Rank/Name: \_\_\_\_\_

1. Reference:

- a. F/A-18 A/B/C/D NATOPS A1-F18AC-NFM-000 Part 1, Section 2.8 and Part IV
- b. COMNAVAIRSYSCOM Flight Clearance DTG 072007Z MAR 01
- c. F/A-18 A/B/C/D High Angle of Attack (AOA) Flying Qualities and Departure Characteristics Brief
- d. F/A-18 A/B/C/D Flight Control Surface Rigging and Radome Brief
- e. The edge of the envelope: Understanding the F/A-18 out of control video (Number 80621)

2. Prerequisite Training

I certify that I have completed the review of references (a) and (b).

\_\_\_\_\_  
(Signature) Date \_\_\_\_\_

3. Ground Training Requirements:

Brief references (c), (d), and (e) Completed: \_\_\_\_\_  
(Signature) Date \_\_\_\_\_

4. Simulator Training Completed: \_\_\_\_\_  
(Standardization Pilot's Signature) Date \_\_\_\_\_

5. Flight Training: \_\_\_\_\_

a. Flight 1 \_\_\_\_\_  
(Standardization Pilot's Signature) Date \_\_\_\_\_

b. Flight 2 \_\_\_\_\_  
(Standardization Pilot's Signature) Date \_\_\_\_\_

c. Flight 3 (Check Flight) \_\_\_\_\_  
(Standardization Pilot's Signature) Date \_\_\_\_\_

6. Endorsements: Recommendation for designation as Departure Training Instructor Pilot.

\_\_\_\_\_  
(Program Manager, USNTPS) Recommendation/Not Recommended \_\_\_\_\_  
(Date)

\_\_\_\_\_  
(CO USNTPS) Recommended/Not Recommended \_\_\_\_\_  
(Date)

\_\_\_\_\_  
(CO TESTWINGLANT) Recommended/Not Recommended \_\_\_\_\_  
(Date)

Sample  
FRS Departure Training Instructor Pilot  
Endorsement Letter

From: Commander, Naval Test Wing Atlantic

To: Commanding Officer, (F/A-18 FRS)

Subj: RECOMMENDATION FOR DESIGNATION AS FLEET REPLACEMENT  
SQUADRON DEPARTURE TRAINING INSTRUCTOR PILOT ICO  
(name of recommendee)

Ref: (a) NAVAIRINST 3502.1

1. (Name of recommendee) has successfully completed the training outlined in reference (a) and has my recommendation for designation as Fleet Replacement Squadron (FRS) Departure Training Instructor Pilot.

Signature  
Title

**Sample NAVAIR Departure Training  
Standardization Pilot Designation Letter**

**From:** Commander, Naval Test Wing Atlantic  
**To:** (recommendee)

**Subj:** DESIGNATION AS NAVAIR DEPARTURE  
TRAINING STANDARDIZATION PILOT

**Ref:** (a) NAVAIRINST 3502.1

1. Having successfully completed the training outlined in reference (a), I hereby designate you as a NAVAIR Departure Training Standardization Pilot.

Signature  
Title

Enclosure (6)